

CLAIMS

1. A reception quality notifying method comprising:
a reception step of receiving a multicarrier signal;
5 a measurement step of measuring reception quality
of the multicarrier signal on a subcarrier basis;
a generation step of comparing a measurement result
on the subcarrier basis in the measurement step with a
predetermined threshold value and performing format
10 conversion on a comparison result to generate a plurality
of reception quality data expressed by bits;
a selection step of selecting reception quality data
with a smallest data amount from the plurality of generated
reception quality data; and
15 a transmission step of transmitting the selected
reception quality data.
2. The reception quality notifying method according
to claim 1, wherein the plurality of reception quality
20 data generated in the generation step include first
reception quality data in which the comparison result
is expressed by bits in ascending order of subcarrier
numbers of subcarriers constituting the multicarrier
signal, and at least one of second reception quality data
25 in which subcarrier numbers of subcarriers with reception
quality more than or equal to the threshold value are
expressed by bits based on the comparison result and third

reception quality data in which subcarrier numbers of subcarriers with reception quality less than the threshold value are expressed by bits based on the comparison result.

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3. The reception quality notifying method according to claim 1, wherein the plurality of reception quality data generated in the generation step include first reception quality data in which the comparison result is expressed by bits in ascending order of subcarrier numbers of subcarriers constituting the multicarrier signal, and second reception quality data in which subcarrier numbers of subcarriers with reception quality more than or equal to the threshold value are expressed by bits based on the comparison result, and

further comprising a threshold value adjustment step of increasing the threshold value in the generation step when the number of other radio communication terminal apparatuses that perform communication using the multicarrier signal increases, and decreasing the threshold value when the number of the other radio communication terminal apparatuses decreases.

4. The reception quality notifying method according to claim 1, wherein the plurality of reception quality data generated in the generation step include first reception quality data in which the comparison result

is expressed by bits in ascending order of subcarrier numbers of subcarriers constituting the multicarrier signal, second reception quality data in which subcarrier numbers of subcarriers with reception quality more than
5 or equal to the threshold value are expressed by bits based on the comparison result, and third reception quality data in which subcarrier numbers of subcarriers with reception quality less than the threshold value are expressed by bits based on the comparison result; and
10 further comprising a threshold value adjustment step of increasing the threshold value in the generation step when the number of other radio communication terminal apparatuses that perform communication using the multicarrier signal increases, and decreasing the
15 threshold value when the number of the other radio transmission apparatuses decreases.

5. The reception quality notifying method according to claim 2, wherein the first reception quality data,
20 the second reception quality data or the third reception quality data is provided with a different identification number expressed by bits in at least one of a beginning part and a last part.

25 6. A reception quality notifying method in which a plurality of radio communication terminal apparatuses receiving downlink multicarrier signals notify reception

quality of the downlink multicarrier signals to a base station apparatus transmitting the downlink multicarrier signals, the method comprising:

5 a downlink transmission step of, in the base station apparatus, transmitting the downlink multicarrier signals to the plurality of radio communication terminal apparatuses;

10 a downlink reception step of, in each of the plurality of radio communication terminal apparatuses, receiving a downlink multicarrier signal;

a measurement step of, in each of the plurality of radio communication terminal apparatuses, measuring reception quality of the downlink multicarrier signal on a subcarrier basis;

15 a generation step of, in each of the plurality of radio communication terminal apparatuses, comparing a measurement result on the subcarrier basis in the measurement step with a predetermined threshold value, performing format conversion on a comparison result to
20 generate a plurality of reception quality data expressed by bits;

a selection step of, in each of the plurality of radio communication terminal apparatuses, selecting reception quality data with a smallest data amount from
25 the plurality of generated reception quality data;

an extraction step of, in each of the plurality of radio communication terminal apparatuses, extracting

control information included in the downlink multicarrier signal;

an uplink signal generation step of, in each of the plurality of radio communication terminal apparatuses, 5 assigning the reception quality data selected in the selection step to a subcarrier specified by the control information extracted in the extraction step to generate an uplink multicarrier signal;

an uplink transmission step of, in each of the 10 plurality of radio communication terminal apparatuses, transmitting the generated uplink multicarrier signal to the base station apparatus;

an uplink reception step of, in the base station apparatus, receiving the uplink multicarrier signals 15 respectively transmitted from the plurality of radio communication terminal apparatuses;

a determination step of, in the base station apparatus, determining respective formats of the reception quality data included in the uplink 20 multicarrier signals;

a control information generation step of, in the base station apparatus, generating the control information for specifying the subcarrier to be assigned to the reception quality data in the uplink signal 25 generation step in each of the plurality of radio communication terminal apparatuses, according to the determined respective formats of the reception quality

data; and

a downlink signal generation step of, in the base station apparatus, generating the downlink multicarrier signals including the control information.

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7. The reception quality notifying method according to claim 6, wherein:

the plurality of reception quality data generated in the generation step include first reception quality data in which the comparison result is expressed by bits in ascending order of subcarrier numbers of subcarriers constituting the multicarrier signal and second reception quality data in which subcarrier numbers of subcarriers with reception quality more than or equal to the threshold value are expressed by bits based on the comparison result; and

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in the control information generation step, when the base station apparatus determines that the uplink multicarrier signals include the first reception quality data and the second reception quality data in the determination step, the base station apparatus generates the control information preferentially for a radio communication terminal apparatus transmitting the second reception quality data in the uplink transmission step rather than another radio communication terminal apparatus transmitting the first reception quality data in the uplink transmission step.

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8. The reception quality notifying method according to claim 6, wherein:

the plurality of reception quality data generated
5 in the generation step include first reception quality data in which the comparison result is expressed by bits in ascending order of subcarrier numbers of subcarriers constituting the multicarrier signal, second reception quality data in which subcarrier numbers of subcarriers
10 with reception quality more than or equal to the threshold value are expressed by bits based on the comparison result and third reception quality data in which subcarrier numbers of subcarriers with reception quality less than the threshold value are expressed by bits based on the
15 comparison result; and

in the control information generation step, when the base station apparatus determines that the uplink multicarrier signals include the first reception quality data and at least one of the second reception quality
20 data and the third reception quality data in the determination step, the base station apparatus generates the control information preferentially for a radio communication terminal apparatus transmitting the second reception quality data or the third reception quality
25 data in the uplink transmission step rather than another radio communication terminal apparatus transmitting the first reception quality data in the uplink transmission

step.

9. The reception quality notifying method according to claim 6, wherein:

5 the plurality of reception quality data generated in the generation step include first reception quality data, comprising a first identification number expressed by bits, in which the comparison result is expressed by bits in ascending order of subcarrier numbers of
10 subcarriers constituting the multicarrier signal, and the second reception quality data, comprising a second identification number expressed by bits, in which subcarrier numbers of subcarriers with reception quality more than or equal to the threshold value are expressed
15 by bits based on the comparison result; and

in the generation step, when a data amount of the first reception quality data is the same as a data amount of the second reception quality data, each of the plurality of radio communication terminal apparatuses adds a
20 plurality of second identification numbers to the second reception quality data to form difference between the data amount of the first reception quality data and the data amount of the second reception quality data.

25 10. A radio communication terminal apparatus comprising:

a receiver that receives a downlink multicarrier

signal;

a measurer that measures reception quality of the downlink multicarrier signal on a subcarrier basis;

a generator that compares a measurement result on
5 the subcarrier basis in the measurer with a predetermined threshold value and performs format conversion on a comparison result to generate a plurality of reception quality data expressed by bits;

a selector that selects reception quality data with
10 a smallest data amount from the plurality of generated reception quality data; and

a transmitter that transmits an uplink multicarrier signal including the selected reception quality data.

15 11. A base station apparatus that performs radio communication with the radio communication terminal apparatus according to claim 10, comprising:

a transmitter that transmits downlink multicarrier signals to the plurality of radio communication terminal
20 apparatuses;

a receiver that receives uplink multicarrier signals including reception quality data indicating reception quality of the downlink multicarrier signals transmitted from the plurality of radio communication terminal
25 apparatuses;

a determiner that determines formats of the reception quality data included in the uplink

multicarrier signals for each of the plurality of radio communication terminal apparatuses; and

an assignment determiner that determines respective subcarriers to be assigned to the plurality of radio communication terminal apparatuses in accordance with the determined formats.